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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER				
DANEGA, RENEE A				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/537,643

Applicant(s)

MIN ET AL.

Examiner

Renee Danega

Art Unit

3736

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-25 is/are allowed.
- 6) ☒ Claim(s) 10-19 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Claim Objections

1. Claim 26 is objected to because of the following informalities: Claim 26 refers to "the device" of claim one. There is no antecedent basis for the device in claim 1. It is unclear whether claim 26 was meant to depend from claim 18. Appropriate correction is required.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10-17 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Min et al. ("Design Concepts of Instruments for Vector Parameter Identification") in view of Eek et al. and Pradeep et al. ("Generalized Structure of a Multilevel PWM Inverter")

- Min teaches a method for measuring of an electrical complex impedance of an object using periodic non-sine wave signals comprising measuring a response signal from the object to the excitation signal using synchronous demodulation wherein the reference signal is a rectangular wave and both the excitation and reference signals have constant value sections, and generating a first modified signal by modifying either the excitation or

- reference signal so that the constant value sections of the first modified signal are shortened by a predetermined first time interval during which said first modified signal has an upper and lower constant value section (pgs 1-3). Min doesn't expressly teach shortening the signals to suppress higher harmonics. However, Eek teaches higher harmonics can overlay with impedance signals of a heartbeat and shortening signals over a first time interval to measure complex impedance of a heart (pg 1, Figure 4). It would have been obvious in view of Eek to suppress high harmonics in Min in order to measure the complex impedance of the heart. Min further doesn't teach using rectangular signals with upper and lower value sections with a third constant value averaging the upper and lower values in between, but rather a stepped waveform. However, Pradeep teaches pulse width modulation for creating constant value shortened rectangular waves in the elimination of harmonics to be a known substitution for stepped waveforms and, in some instances requiring high power, to be preferable (pgs 1-3, Figure 3). It would have been obvious in view of Pradeep to substitute a rectangular wave in Min in order to measure complex impedance in high power applications.
- Min doesn't expressly teach shortening signals over a first time interval to suppress the 3rd harmonic, but does teach shortening them to eliminate harmonics (Figure 4) (pg 2). Eek et al. teaches a method of measuring impedance having the method step of suppressing signal harmonics

interfering with accurate signals (see page 2). It would have been obvious in view of Eek et al. to select a predetermined first time interval of Min to suppress the 3rd harmonic in order to be able to separate and identify the signal components in bioimpedance measuring.

- Regarding claims 12, 13 and 15, Eek et al. would meet the respective time intervals in the first and second of the excitation and reference signals to suppress unwanted harmonics with Pradeep shortening the waves such that they have an intermediate zero value for harmonic suppression as stated above. Further, such intervals could be found through application of known Fourier transforms by one of ordinary skill in the art for eliminating harmonics.
- Regarding claims 14 and 17, Pradeep teaches taking the signal to zero during harmonic suppression.

3. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kinast (US 6377845) in view of Pradeep et al. ("Generalized Structure of a Multilevel PWM Inverter").

- Regarding claim 18, Kinast teaches a device for measuring of an electrical complex impedance comprising a first generator (33) for generating an excitation signal capable for generating a modified rectangular wave signal, the signal having constant value sections shortened by a first time interval during each half period to suppress higher harmonics; a second generator for generating a reference signal, wherein the reference is a

modified rectangular wave signal having constant value sections shortened by a second time interval during each half period to suppress higher harmonics; and a synchronous detector having first and reference input for receiving a response signal from an object and a reference signal (column 13, lines 34-45) (claims 3, 5) (column 11, lines 31-50). Kinast teaches the detector capable of outputting a signal that is free of the higher harmonics but not that the first and second generators are capable of generating signals suppressing first and second sets of harmonics. However, Pradeep teaches a generator capable of generating various rectangular signals that are shortened at different intervals to eliminate different harmonics at the points where the signals have values of zero (pgs1-2, Figure 3). It would have been obvious in view of Pradeep to enable Kinast's device to generate signals that reach zero at different points to eliminate different harmonics during demodulation.

- Regarding claim 19, Kinast teaches the phase shift between the excitation signal and reference signal is 90 degrees (column 11, lines 36-40).

Allowable Subject Matter

4. Claims 20-25 are allowed for the reasons stated in the prior action.

Response to Arguments

5. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Renee Danega whose telephone number is (571)270-3639. The examiner can normally be reached on Monday through Thursday 8:30-5:00 eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on (571) 272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RAD

/Max Hindenburg/
Supervisory Patent Examiner, Art Unit 3736